

REMARKS

This paper is responsive to a Final Office action dated August 31, 2007. Claims 1-8, 10-19, 23-31, 33-42, 45-51, and 53-55 were examined.

Claim Objections

Claim 49 is canceled to correct informalities.

Claim Rejections Under 35 U.S.C. § 112

Claims 1, 24, 42, 45, 47, 50, 51, and 54 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claims 1 and 24 are canceled.

Regarding claim 47, Applicants respectfully maintain that the limitation requiring

the electrically conductive plate is formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture

satisfies the requirements of 35 U.S.C. § 112, second paragraph. Applicants respectfully point out that definiteness of claim language is determined based on “whether those skilled in the art would understand what is claimed when the claim is read in light of the specification.” See Bancorp Services LLC v. Hartford Life Ins. Co., 69 USPQ2d 1996, 1999 (Fed. Cir. 2004) (emphasis added); see also MPEP § 2173.02. Note that “a claim is not indefinite merely because it poses a difficult issue of claim construction; if the claim is subject to construction, i.e., it is not insolubly ambiguous, it is not invalid for indefiniteness.” See Bancorp, 69 USPQ2d at 1999. Applicants respectfully maintain that claim 47 satisfies this requirement. Furthermore, Applicants note that the claimed embodiment is fully described in the specification. Applicants respectfully point the Examiner to at least Figures 9A, 9B, and 11A, and associated portions of the specification.

At least Figures 9A and 9B, and associated portions of the specification describe the relationship between an aperture and an inductor:

[a]perture 902 is substantially parallel to the current flow through inductor 912. Aperture 902 is larger than the inductor by approximately one half the diameter of the inductor and separates the inductor from the shield by approximately half of an inner diameter of the inductor, were the inductor projected into the same plane as the shield. An effective diameter, i.e., a diameter between two opposing linear surfaces of the aperture, may be determined by adding approximately an approximate inner diameter of the inductor to an approximate outer diameter of the inductor. For example, inductor 912 has two turns formed in 10 μ m metal and has an inner diameter of 58 μ m and an outer diameter of approximately 100 μ m. An appropriate aperture diameter is approximately 160 μ m.

Paragraph 1065. At least Figure 11A and associated portions of the specification describe embodiments of the electromagnetic shielding structure which include aperture 1112:

[a]n exemplary plate of the electromagnetic shield (e.g., bottom plate 1100) approximates a solid metal plate by forming a plurality of continuous conductive patterns that are substantially concentric with respect to an aperture in the plate or, in one embodiment, substantially concentric with respect to the inductor projected into the same plane as the continuous conductive patterns. Referring to FIG. 11A, N substantially octagonal continuous conductive patterns, e.g., continuous conductive patterns 1102, 1104,..., 1106, are formed in a metal layer (e.g., metal-1) and are substantially concentric with respect to aperture 1112 in the bottom plate of an electromagnetic shielding structure. Continuous conductive patterns 1102, 1104, and 1106 are 10 μ m wide. Continuous conductive patterns 1102 and 1104 are separated by a gap in the metal layer, i.e., gap 1108, that is 2 μ m wide, and typically filled with a dielectric material.

Paragraph 1072. The specification teaches further that

[t]he continuous conductive patterns may be based at least in part on a substantially octagonal, circular, rectangular, or other suitable shape. In an exemplary embodiment, only a portion of the octagonal patterns above intersection 1110 is formed and the portions of the octagonal patterns are substantially closed by another continuous conductive pattern formed below intersection 1110. The continuous conductive patterns may be formed in typical integrated circuit layers, ultra-thick layers, redistribution layers, or other suitable conductive layers. Dimensions may vary according to a target manufacturing process. The

plate may include conductive links extending across aperture 1112 as shown (not to scale). In other embodiments of the invention, bottom plate 1100 may be formed from a substantially continuous conductive layer.

Paragraph 1074. Accordingly, Applicants respectfully maintain that claim 47 satisfies the requirements of 35 U.S.C. § 112, second paragraph, and respectfully request that the rejections be withdrawn.

Regarding claim 51, Applicants respectfully maintain that the limitations requiring that the aperture is at least as large as the inductor and is substantially centered around a projected surface of the inductor,

satisfies the requirements of 35 U.S.C. § 112, second paragraph. Applicants respectfully point out that definiteness of claim language is determined based on “whether those skilled in the art would understand what is claimed when the claim is read in light of the specification.” See Bancorp Services LLC v. Hartford Life Ins. Co., 69 USPQ2d 1996, 1999 (Fed. Cir. 2004) (emphasis added); see also MPEP § 2173.02. Note that “a claim is not indefinite merely because it poses a difficult issue of claim construction; if the claim is subject to construction, i.e., it is not insolubly ambiguous, it is not invalid for indefiniteness.” See Bancorp, 69 USPQ2d at 1999. Applicants respectfully maintain that claim 51 satisfies this requirement. Furthermore, Applicants note that the claimed embodiment is fully described in the specification. Applicants respectfully point the Examiner to at least Figures 9A, 9B, and 11A, and associated portions of the specification.

Figures 9A and 9B, and associated portions of the specification describe the relationship between an aperture and an inductor. Figure 11A and associated portions of the specification describe embodiments of the electromagnetic shielding structure which include aperture 1112. Accordingly, Applicants respectfully maintain that claim 51 satisfies the requirements of 35 U.S.C. § 112, second paragraph, and respectfully request that the rejections be withdrawn.

Regarding claim 54, Applicants respectfully maintain that the limitations requiring that the electrically conductive plate is formed by a plurality of continuous conductive patterns, each of the continuous conductive patterns being substantially concentric with respect to the aperture.

satisfies the requirements of 35 U.S.C. § 112, second paragraph. Applicants respectfully point out that definiteness of claim language is determined based on “whether those skilled in the art would understand what is claimed when the claim is read in light of the specification.” See Bancorp Services LLC v. Hartford Life Ins. Co., 69 USPQ2d 1996, 1999 (Fed. Cir. 2004) (emphasis added); see also MPEP § 2173.02. Note that “a claim is not indefinite merely because it poses a difficult issue of claim construction; if the claim is subject to construction, i.e., it is not insolubly ambiguous, it is not invalid for indefiniteness.” See Bancorp, 69 USPQ2d at 1999. Applicants respectfully maintain that claim 54 satisfies this requirement. Furthermore, Applicants note that the claimed embodiment is fully described in the specification. Applicants respectfully point the Examiner to at least Figures 9A, 9B, and 11A, and associated portions of the specification.

Figures 9A and 9B, and associated portions of the specification describe the relationship between an aperture and an inductor. Figure 11A and associated portions of the specification describe embodiments of the electromagnetic shielding structure which include aperture 1112. Accordingly, Applicants respectfully maintain that claim 54 satisfies the requirements of 35 U.S.C. § 112, second paragraph, and respectfully request that the rejections be withdrawn.

Claim Rejections Under 35 U.S.C. § 102

Claims 23, 46, 49, and 51 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,959,522 to Andrews (hereinafter, “Andrews”). Regarding claim 23, Applicants respectfully maintain that Andrews, alone or in combination with other references of record, fails to teach or suggest

individual ones of the electrically conductive links are coupled to each other by an electrically

conductive link perpendicular to the individual ones
of the electrically conductive links,

as required by claim 23. Andrews teaches that

[w]hen lower shielding layer 142 is conductive, the flux concentration induces eddy currents that circulate in lower shielding layer 142 in a direction opposite to that of the applied current flowing along conduction path 140. The eddy currents also induce an opposing magnetic flux which is coupled from lower shielding layer 142 to conduction path 140 to reduce the effective inductance of inductor 112. To reduce these eddy currents, lower shielding layer 142 is patterned with openings 156 running perpendicular to the direction of applied current to interrupt the current paths of the eddy currents. In the embodiment shown in FIG. 2, where conduction path 140 is formed as a circular spiral, openings 156 project radially from the axis of conduction path 140 so as to be perpendicular to the windings of conduction path 140. Such patterning can produce as much as an eightfold increase in the effective inductance as compared with prior art inductors using an unpatterned lower shielding layer. Openings 156 have an additional benefit of reducing the area of lower shielding layer 142, which reduces the parasitic substrate capacitance of inductor 112 and increases its maximum operating frequency.

Col. 3, lines 43-63 (emphasis added). Openings 156 of Andrews project radially from the axis of conduction path 140 to be perpendicular to windings of conduction path 140, which operates as an inductor. Col. 2, lines 52-54; col. 3, 43-63; Fig. 2. Shielding layer 156 of Andrews is not coupled to windings of conduction path 140. Openings in shielding layer 142 of Andrews fail to teach or suggest individual ones of the electrically conductive links are coupled to each other by an electrically conductive link perpendicular to the individual ones of the electrically conductive links, as required by claim 23. Since Andrews, alone or in combination with other references of record, fails to teach or suggest the limitations of claim 23, Applicants respectfully request that the rejection of claim 23 and all claims dependent thereon, be withdrawn.

Claim 49 is canceled.

Claim Rejections Under 35 U.S.C. § 103

Claims 53 and 55 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andrews. Claim 55 is amended to depend from claim 23 to reduce issues for appeal. Applicants respectfully maintain that claims 53 and 55 depend from allowable base claims and are allowable

for at least this reason. Accordingly, Applicants respectfully request that the rejection of claims 53 and 55 be withdrawn.

Claims 1-7, 24-30, 42, 45, 47-48, 50, and 54 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andrews in view of U.S. Publication No. 2004/0094822 to Yu. Claims 1, 24-30, 42, 45, 48, and 50 are canceled. Claims 2, 4-7, 47 and 54 depend from allowable base claims and are allowable for at least this reason.

Claims 8, 10-19, 31, and 33-41 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Andrews in view of Yu and further in view of U.S. Patent No. 6,847,282 to Gomez et al. (hereinafter, "Gomez"). Claims 31 and 33-41 are canceled. Applicants respectfully maintain that claims 8 and 10-19 depend from allowable base claims and are allowable for at least this reason. Accordingly, Applicants respectfully request that the rejections of claims 8 and 10-19 be withdrawn.

Additional Remarks

Claims 2, 4-8, 15-17, and 55 are amended to depend from claim 23.

Claim 3 is canceled.

Claim 7 is amended to correct antecedent basis.

Claim 23 is amended to correct a typographical error.

In summary, all claims are believed to be allowable over the art of record, and a Notice of Allowance to that effect is respectfully solicited. Nonetheless, if any issues remain that could be more efficiently handled by telephone, the Examiner is requested to call the undersigned at the number listed below.

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